CHAPTER VII
SUMMARY OF FINDINGS, CONCLUSION AND SUGGESTIONS

7.1 INTRODUCTION

Pulses occupy a prominent place in Indian agriculture. The area under pulses in the country is the largest, accounting for about one-third of the world’s area under the crop. Since Independence, the Indian Government has been emphasising the importance of agricultural development. The New Agricultural Strategy (NAS) was initiated in 1966. Accordingly, policies were formulated to utilize and promote high yielding crops of food grains in all districts selected under the IADF and IAAP schemes. The NAS was first introduced in the karif season of 1966. It also came to be known as the High Yielding Crops Programme (HYCP). The persistent efforts made by the Indian agricultural scientists since the introduction of HYCP resulted in the evolution of numerous high-yielding crops of principal crops and new farm practices.

Under HYCP, varietal improvement helps packing into the seed and ability to yield more for a given situation. The implementation of HYCP has brought about an increase in pulses production. Pulses are the
most important food crop of Tamil Nadu. The introduction of High-
Yielding Crops Programmes in the mid-60s brought about a significant
increase in production and productivity of food grains in the State.
Hence, in the present study an attempt has been made to study the cost
and returns of pulses namely black gram and green gram cultivation in
Thoothukudi district.

Thoothukudi district in Tamil Nadu State is one of the most
important districts where there has been a significant progress for
cultivating pulses. Pulses are mainly cultivated in almost all the seven
taluks in this district.

The main objective of the study is to analyse the cost and returns,
determinants of yield and supply responsiveness of selected pulses
production in Thoothukudi district. The specific objectives of the study
are:

1. To analyse the cost and return structure of black and green
   grams and of small and large farmers producing black and
   green grams.
2. To identify and analyse the determinants of yield and factors causing yield gap with regard to farmers cultivating two crops of pulses and of small and large farmers group.

3. To estimate and analyse the input demand elasticities and supply responsiveness of two group of farmers cultivating black and green grams.

4. To investigate the labour absorption capacity and supply responsiveness of each crop with regard to their own prices and prices of variable inputs and units of fixed inputs.

5. To study the nature and returns to scale for both black and green grams cultivating farmers.

A random sample of 300 farmers, 150 each from BG and Green Gram cultivators of pulses was selected from 15 villages of three blocks in Thoothukudi District. These 300 sample farmers were selected randomly by adopting proportionate random sampling technique from 15 villages.

The sample farmers in each crop were classified into Large and Small farmer groups. Those cultivating an area of five acres and more were grouped under the Small farmer category, while those cultivating less than five acres of land were classified as large farmers. There were
98 Large farmers and 52 Small farmers in the case of Black Gram whereas in the case of Green Gram 103 and 47 were under Large and Small farmer groups respectively. The homogeneity with respect to net income per acre of these two crops namely Black Gram and Green Gram of pulses is examined by using the analysis of variance technique. It was found that there existed significant difference between them and they were treated as a separate unit for further analysis.

In the foregoing chapters, the characteristics of the selected farmers, cost and returns structure, determinants of yield, yield gap and yield constraints, input demand elasticities, supply responsiveness, and labour absorption, have been discussed. The major findings along with conclusions and suggestions are now presented in this chapter.

7.2 SUMMARY OF FINDINGS

Cost and Return Structure

A study of the input and output structure at mean levels of Large and Small farmers producing Black Gram of pulses revealed that Small farmers obtained significantly larger yield per acre than the Large farmers. The significant difference between two groups of farmers was found with respect to chemical fertilizers and pesticides. The yield reaped by Large farmers was relatively less compared to Small farmers in
the study area. At the same time, the inputs namely fertilizers and pesticides used by Large farmers were found to be higher than their counterpart. Similar results were also observed in the case of Large and Small farmers cultivating Green Gram of pulses. But a comparison of the levels of input use and yield obtained per acre by two farmer groups in each crop revealed a higher yield and more uses of inputs in the case of Black Gram than the Green Gram. Thus, it is observed that the cultivation of Black Gram required a higher level of fertilizer application and lower level of pesticides due to its greater responsiveness to the output. Further, a Small farmer is likely to have a greater interest in maximizing his farm output than the Large farmer and pulses cultivation normally needs a quite close supervision which is easier on Small farms. A Small farmer is more likely to have an intimate knowledge of his farmland and its requirements. These help to increase the production efficiency on Small farmers in both crops in the study area.

Thus, it may be concluded from the analysis that the Small farmers were efficient in the use of inputs and they produced more yield than the Large farmers.

Pulses cultivation in general was found to be labour intensive in the study area. The analysis of utilisation of labour in both crops revealed the
The fact that the cultivation of Black Gram of pulses at Small farmer can help to provide gainful employment to the rural population under both farmer groups.

The analysis of cost and returns structure in the farmers cultivating Black Gram (BG) and Green Gram (GG) of pulses revealed that the Large farmers received higher returns amounting to Rs.4760.81 in the case of BG and Rs.6163.34 in the case of GG. The yield per acre of Large farmers was 181.61 kgs and it was 194.12 kgs in the case Small farmers producing BG of pulses. Whereas in the case GG of pulses, the yield per acre was 182.31 kgs for Large farmers and 196.12 kgs for Small farmers. Thus, it is inferred that the BG crop yielded higher returns in physical and monetary terms and it is found, to be more profitable than the Green Gram in the study area. It was also observed from the analysis that Large farmers spent higher amount per acre and received lesser net returns compared to Small farmers in both varieties.

The variable cost formed about 86 per cent of the total cost in both varieties. Human labour, the major cost component, accounted for nearly 39 per cent of the total cost. The pattern of other input expenditures was almost similar to the two varieties.
Thus, it may be concluded from the analysis that the yield per acre of Small farmers was significantly higher than that of the Large operator. This may be due to the more intensive use of inputs and better personal supervision and farm management by Small farmers for both varieties.

An examination of the economics of pulses cultivation showed that each rupee spent resulted in a benefit 1.82 in the case of Large farmers and 1.98 in the case Small farmers cultivating BG of pulses. Whereas in the case of GG of pulses, it was 2.13 and 2.48 for Large and Small farmers respectively. It indicated that this could be the outcome of better economies and institutional position of Small farmers compared with those of Large farmers in the study area.

**Determinants of Yield, Yield Gap and Yield Constraints**

A Cobb-Douglas type of multiple regression models was fitted to identify the major determinants of yield of Large and Small farmer groups cultivating BG and GG of pulses. The five independent crops chosen to explain the variations in the yield of pulses were (i) human labour (ii) bullock labour (iii) fertilizer (iv) pesticides and (v) capital flows.
In the case of Large and Small farmers cultivating Black Gram of pulses, all the five independent variables jointly explained about 79 to 81 per cent of the variations in the yield of pulses. Among the significant variables, human labour had a greater influence on the determination of yield in the case of Small farmers, it was followed by fertilizer. The fitted regression model emerged highly significant.

In the case of Small farmers, the impact of capital flows on yield of pulses was found to be higher and it was followed by the variable human labour. The fitted regression model was statistically significant at five per cent level. In overall case, capital flows were found to be the most influential input on yield determinations of Black Gram of pulses.

In order to examine whether structural difference existed between Large and Small farmers cultivating Black Gram, Chow’s Test was applied. The results revealed that there existed structural difference between the two groups of farmers. Further, it is observed that there is a neutral technical change between the two farmer groups. At slope level, variable fertilizer was responsible for the difference in their yield. Thus, it may be concluded that the use of fertilizers differentiated in yield of Large and Small farmers cultivating Black Gram of pulses in the study area.
The regression analysis for Green Gram revealed that the independent variables caused about 78 to 81 per cent of the variations in the yield per acre. The variables, human labour, fertilizer and capital flows were significantly related to yield for both farmer groups. Fertilizer and capital flows were found to be the most influential variables in the determination of yield for Large and Small farmers respectively. The fitted regression model was statistically significant at five per cent level.

The examination of the structural differences between Large and Small farmers revealed that there existed a structural difference between Large and Small farmers in the study area. The analysis based on dummy variables revealed the existence of structural difference between two groups at slope level. At the slope level, input namely capital flows were responsible for the differences in yield. At the intercept level, the coefficient of dummy variable was not statistically significant, indicating that there was a neutral technical change between the two farmer groups in the study area.

The analysis of yield gap revealed the existence of a gap between the potential and actual yield per acre for both farmer groups in each category of group. The yield gap was found higher in the case of Small farmers than in the case of Large farmers.
The Garrett’s ranking technique was applied to identify the major constraints to the attainment of potential yield and it was found that severity of disease and pest attacks and water shortage were identified as major constraints for both Large and Small farmers cultivating BG of pulses. In the case Green Gram, Large farmers have reported that the inadequate credit facilities and water shortage to be the main constraints to maximum yield. Similarly, the majority of the Small farmers have identified water shortage as a major constraint. Thus, it may be concluded that severity of diseases, inadequate credit facilities and water shortage were identified as major constraints in the study area.

**Analysis of Input Demand Elasticities and Supply Responsiveness**

The analysis of labour demand elasticities revealed that labour demand was highly sensitive to changes in pulses price for both Large and Small farmers in each category. The demand for labour with regard to real wage rate was elastic in both cases. It is observed from the analysis that increase in farm wage had a relatively serious negative effect on the demand for labour. In other words, 10 per cent reduction in the wage rate could increase labour employment by more than 10 per cent. But in practice, wage reduction may not be possible in order to
increase farm employment. Comparing these two varieties, the reduction was found high in the case of GG than BG of pulses cultivation.

It is also observed from the analysis that the negative and low responsiveness of labour demand resulted in an increase in the price of bullock pairs, fertilizers and pesticides which indicated that manipulation of input price was not effective. Increase in area under pulses of both crops had favourable effects on labour demand while the impact of changes in capital flows was low.

The analysis of the demand for variable inputs in response to changes in their own prices for both groups in each crop revealed that demand for variable inputs was elastic and sensitive to changes in their own prices. The cross price elasticities of the inputs were negative and low for both farmer groups in each variety. It indicates that these variables were complements rather than substitutes.

Regarding the supply responsiveness, supply elasticities were highly sensitive to price changes in pulses for both farmer groups under each category. The negative and low responsiveness of output supply resulted in an increase in prices of variable inputs namely human labour, fertilizer and pesticides. Fixed factors produce a favourable impact on
the same for both farmer groups. Capital flows had a higher impact on Small farmers than on Large farmers in BG and GG of pulses in the study area.

The indirect estimates for the groups of farmers in both crops revealed that land and human labour were the dominant factors. It is evident from the analysis that the share of land of total output was the highest for Large and Small farmers.

In both cases, the constant returns to scale were found to prevail with respect to production of BG and GG of pulses in the study area. Regarding technical change and factor shares, the results indicate that share of land is the maximum in pulses cultivation of both the varieties. It is found that there is a difference between the two crops regarding the share of land in output. The labour share of output is found to be higher for BG than GG. Therefore, the share of labour decreases substantially as one move from Green Gram to Black Gram. It indicates that it is due to efficiency gain in the cultivation of pulses in terms of labour under Black Gram compared to Green Gram. In the case of capital the Black Gram requires more of capital inputs than the Green Gram. The share of capital is found to be high in BG and GG.
7.3 CONCLUSION

Thus, it is concluded from the analysis that small farmers are economically more efficient than large farmers irrespective of varieties of pulses cultivation in the study area. This could be due to the better supervision and more efficient farm management favoured by the smaller size of operational holdings. This indicated that apart from the efficient allocation of inputs, direct supervision and farm management are crucial determinants of economic efficiency.

7.4 SUGGESTIONS

It is suggested on the basis of the findings that the extension service officials may improve technical efficiency by advising the farmers on input application at the proper time as recommended.

The farmers in the study area were of the opinion that they could not achieve the maximum yield due to the severity of diseases and pest attacks. It is suggested that the farmers should be educated properly to apply the pesticides at the prescribed level and this may be possible by the agricultural department officer attached to the panchayat unions.
Non-availability of credit was the other constraint. It is suggested that financial institutions should revitalise and revamp the existing credit facilities in the study area so that the farmers could get timely credit for undertaking improved cultivation practices.

Such measures shall certainly pave the way for the farmer’s greater success.

The marketing cost constitutes a major portion of the consumer prices. Hence, Government should encourage the farmers to start co-operative societies in the study area in order to develop a direct link between the wholesalers/retailers, processors and exporters to cut down the marketing cost incurred for lengthy channel.

Majority of the farmers prefer middlemen to sell their produce because of the credit facilities extended by them. The long chain of channels affects the procurement prices of pulses. Therefore, the Government should direct the co-operative and commercial banks in the study area to provide adequate loan facilities at a reasonable rate of interest to the farmers without any rigid formalities.

To sum up, a long term arrangement should be worked out by the Government of Tamil Nadu, to protect the interest of both producers and
consumers of pulses and also to improve the production and marketing of pulses in the study area. It is also very essential to note that the prices offered to farmers are related to the cost of production. Further, a new mechanism has to be innovated to break the stagnation in the production of pulses through adoption of the most modern methods of cultivation and to ensure stable remunerative prices to the farmers. The Government should initiate action to improve market information system and market intelligence. Existing techniques disseminating marketing information should be reviewed. Visual media like television can be used for providing market information to farmers of rural areas. Modern devices such as computers may be employed wherever necessary to make a meaningful estimate of marketable surplus and daily average prices.